EXHIBIT II

CONTRACT DATA REQUIREMENTS LIST

For

Ku-BAND PULSED TRAVELING WAVE TUBE AMPLIFIER

On

THE OCEAN VECTOR WINDS MISSION SCATTEROMETER

Contract Plans and Documentation

The documentation deliverable under the referenced contract is summarized in the following Contract Data Requirements List (CDRL) which identifies the items to be delivered and when delivery is required, the quantity and type of each item, and frequency of issue. The Data Requirement Description (DRD) forms referenced in the CDRL describe the specific requirements for the item(s) to be delivered, reference documents, and other instructions as to content, format, and preparation.

Non-Design Documentation Identification

The contractor shall display on the cover of the title page of all deliverable non-design documentation (all documents except drawings and specifications)* the following minimum information:

(1) Document Title

(2) Contractor's Name

(3) Contract Number

(4) Document Number (JPL or Contractor assigned)

(5) Contract Data , Requirements List (CDRL) item number

(6) Subsystem or Support Equipment Name

(7) Approval Signatures - Contractor For Final document, cite JPL approval letter

(8) Project Identification, viz., "Ocean Vector Winds Mission TWTA"

(9) Date of Issue or Publication

(10) Revision or Change Identification

*The identification of drawings and specifications is defined in Exhibit I, Applicable Documents List, October 10, 2001.

JPL will review documents submitted by the Contractor for JPL approval and approve or provide comments within twenty (20) working days of receipt at JPL, except as otherwise provided for in this Exhibit and the Statement of Work. In the event JPL does not make a formal disposition of a given document within the required twenty (20) days, the document is approved as submitted.

If the draft is approved by JPL, the Contract Negotiator will transmit a letter stating acceptance to the contractor. The contractor shall then prepare and deliver final copies as indicated in the CDRL.

If the original or draft submittal requires modification before JPL approval will be granted, the following steps will be taken:

1. The modifications required by JPL will be sent to the Contractor in writing by the JPL Contract Negotiator and discussed between the parties.

2. The Contractor shall submit an updated draft, containing the required modifications within twenty (20) working days (or as otherwise specified) after receiving written notice of the required modifications.

3. If the updated draft is approved by JPL, the Contract Negotiator will transmit a letter stating acceptance to the Contractor. The Contractor shall then prepare and deliver final copies as indicated in the CDRL.

Documents conditionally approved shall be resubmitted as final documents if all conditions of approval can be met exactly. If it is not possible to exactly meet the conditions of approval, the Contractor shall resubmit the document with all possible corrections completed and a letter explaining why the remaining corrections could not be made. Unless otherwise specified, re-submittal of data for approval shall be so identified and delivered ten (10) working days after receipt of JPL's comments.

Revisions or updates to any data requirements set forth herein shall be resubmitted to JPL. Unless otherwise specified in the CDRL or DRD, the requirements, approvals and number of required copies of the data items originally submitted shall also be applicable to the revision submittals.

Data Distribution

The number of copies to be delivered is provided in the CDRL. All data shall be delivered by a cover letter of transmittal to the JPL Contract Negotiator.

Date Due

Unless otherwise specified, all periods identified in the CDRL are in calendar days.

CDRL Definitions:

In the CDRL form a "yes" designate 'JPL Approval' and shall be interpreted as meaning that the approval of JPL is required before the indicated activity or task can proceed (see discussion above).

A 'no' in the CDRL form indicates that JPL will review the document or item in parallel with the activity. The Contractor does not have to obtain JPL approval to proceed with the activity or task.

JPL intends that the Contractor submit material that is already in electronic form via magnetic media (e.g., word processing documents in Microsoft Word or WordPerfect).

Abbreviations (applies to all exhibits including S.O.W)

ADC	After Date of Contract
AGP	Additional General Provision
AIDS	Assembly, Inspection, and Data Sheet
ARJC	After Receipt of JPL Comments
CDR	Critical Design Review
CDRL	Contract Data Requirements List
C&DH	Command and Data Handling
CM	Configuration Management
D	JPL Document (D-xxxx)
DA	Direct Access
DATE	Direct Access Test Equipment
DRD	Data Requirement Description
DS	Design
EACS	Environmental Analysis Completion Statement
EC	Event Counter
ECI	Engineering Change Instruction
ECR	Engineering Change Request
EIDP	End Item Data Package
EM	Engineering Model
EI	Electromagnetic Interference

ENV	Environmental
EPS	Electrical Power System
E/RE	Environmental/Reliability Engineer
ESD	Electrostatic Discharge
ETSS	Environmental Test Specifications Summary
EQM	Engineering/Qualification Model
FA	Flight Acceptance
FED	Federal
FLT	Flight
FMECA	Failure Made Effects and Critically Analysis
FRD	Functional Requirements Document
FS	Fabrication Specification
FSS	Flight Safety Survey
FTA	Fault Tree Analysis
G&A	General and Administrative
GEN	General
GFP	Government Furnished Property
GIDEP	Government Industry Data Exchange Program
GSE	Government Supplied Equipment
HRCR	Hardware Review/Certification Requirement
HVPS	High Voltage Power Supply
IAW	In Accordance With
ICD	Interface Control Drawing, Interface Control Document,
ICDS	Interface Circuit Data Sheet
I/LL	Inheritance/Lessons Learned
JPEG	Joint Photographic Expect Group
JPL	Jet Propulsion Laboratory
LRE	Latest Revised Estimate
MA	Management
MICD	Mechanical Interface Control Drawing
MIL	Military
MIUL	Materials Identification and Usage List
MLI	Multi-Layer Insulation
MM	Magnetic Media
MMR	Monthly Management Review
MP	Materials and Processes
M&P	Materials and Processes
MRB	Materials Review Board
MTBF	Mean Time Between Failure
MUA	Materials Usage Agreement
NASA	National Aeronautics and Space Administration
NCR	Non-Conformance Report
NHB	NASA Handbook
NSPAR	Non-standard Part Approval Request
OVWM	Ocean Vector Winds Mission
OSS	Operations Safety Survey
PA	Parts
P/FR	Problem/Failure Report
PD	Project Document
PDMS	Product Data Management System
PDR	Preliminary Design Review
PF	Protoflight
PM	Protoflight Model

PMS	Performance Measurement System
POR	Power On Reset
PSA	Parts Stress Analysis
PSR	Pre-Ship Review
PSU	Power Switching Unit
QA	Quality Assurance
RA	Reliability Assurance
RE	Review
RF	Radio Frequency
RFS	Radio Frequency subsystem
SA	Safety
SE	Support Equipment
SECR	Support Equipment Certification Requirement
SEE	Single Event Effect
SEL	Single Event Latchup
SEU	Single Event Upset
SIM	Simulator
SOW	Statement of work
SPF	Single Point Failure
SRD	Software Requirements Document
SRP	Subcontractor Review Plan
SS	System Safety
SPD	Software Specification Document
STD	Standard
STE	Special Test Equipment
STM	Structural/Thermal Model
STRR	Software Test Requirements Review
S/W	Software
TCP/IP	Transmission Control Protocol/Interface Protocol
TD	Technical Document
TDM	Technical Direction Memorandum
TE	Test
TID	Total Ionizing Dose
TLM	Telemetry
TRSF	Test Results Summary Form
TWT	Traveling Wave Tube
TWTA	Traveling Wave Tube Amplifier
VSWR	Voltage Standing Wave Ratio
WBS	Work Breakdown Structure
W	Watts
WCA	Worst Case Analysis

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
CM		**Configuration Management**				
	CM-001	Configuration Management Plan				
	1	Final	Yes	Once	45 ADC	1+ Electronic
	CM-002	Engineering Documentation and Data list				
	1	EQM Data	No	AR	2 Week after EQM Delivery	1+ Electronic
	2	FM Data	No	AR	2 Weeks after FM Delivery	1+ Electronic
	3	TWT and HVPS specification	No	Once	90 days ADOC	1+ Electronic
	4	Engineering Documentation - Preliminary	No	As generated	4 Weeks Before PDR	1+ Electronic
	5	Engineering Documentation - Final	No	As generated	2 Weeks Before EQM PSR	1+ Electronic
	6	Waivers	Yes	As generated	Within 1 week of generation	1+ Electronic
	CM-003	Photographs				
		Photographs in TIFF Electronic format	No	AR	Within 1 week after JPL request	2

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
DS		**Interfaces and Grounding**				
	DS-001	Interface Circuit Data, Interface Circuit Drawing and Grounding Diagram				
	1	Interface Circuit Data - Preliminary	No	Monthly (if changed)	1 Week Before PDR	1+ Electronic
	2	Interface Circuit Data - Final	Yes	Once	2 weeks before EQM PSR	1+ Electronic
	3	Interface Circuit Drawing - Preliminary	No	Monthly (if changed)	1 Weeks before PDR	1+ Electronic
	4	Interface Circuit Drawing - Final	Yes	Once	2 Weeks before EQM PSR	1+ Electronic
	5	Grounding Diagram - Preliminary	No	Monthly (if changed)	1 Weeks Before PDR	1+ Electronic
	6	Grounding Diagram - Final	No	Once	2 Weeks Before EQM PSR	1+ Electronic
	DS-002					
	1	Interface Control Drawing	Yes	Once	With CDR	1+Electronic
ER	ER-001	Packaging Qualification Verification Documentation (Thermal Cycling)				
	1	Thermal Cycling Qualification Assessment Report	No	Once	4 weeks before PDR	1+ Electronic
	2	Test Plan	Yes	Once	4 weeks before PDR	1+ Electronic
	3	Test Reports	No	AR	4 weeks after test	1+Electronic

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
MA		**Management**				
	MA-001	Work Breakdown Structure (WBS) and Dictionary				
	1	Initial	Yes	Once	30 days ADC	
	2	Final	Yes	As needed	15 days after receipt of JPL consent to revise	1+ Electronic
	MA-002	Baseline Cost Estimate				
	1	Initial	No	Once	1 month ADC	1+ Electronic
	2	Revisions	No	As needed	1 month after receipt of JPL consent to revise	1+ Electronic
	MA-003	Detailed and Summary Schedules				
	1	Initial	Yes	Once	45 Days ADC	1+ Electronic
	2	Updates	Yes	monthly	As part of PMR Report	1+ Electronic
	MA-004	Periodic Management Review (PMR) Package and Weekly Status Report				
	1	PMR Package	No	Every other month	At PMR	1+ Electronic
	2	Weekly Status Report	No	weekly	Monday following the reporting week	1 Electronic
	MA-005	Internal Audit Findings Reports	No	As Issued	As Issued	1+Electronic

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
MP		**Material and Process**				
	MP-001	Material and Processes Control Plan				
	1	Final	Yes	Once	60 days ADC	1+ Electronic
	MP-002:	Material and Process Data				
	1	MIUL – Initial	No	AR	4 weeks prior to PDR	1+ Electronic
		MIUL – Prelim	No	AR	At PDR	1+Electronic
		MIUL – Update	No	AR	4 weeks prior to EQM PSR	1+Electronic
		MIUL – Revision	No	AR	At EQM PSR	1+Electronic
	2	Material Usage Agreements	Yes	AR	As Generated	1+ Electronic
	3	Non Standard M& P Design Item Qualification	Yes	Once	4 weeks before PDR	1+ Electronic
	4	Contractor Developed M&P Specifications	No	Once	4 weeks before PDR	1+ Electronic
	5	Waivers	Yes	AR	1 Week after Creation	1+ Electronic
	6	Failure Analysis Reports	Yes	AR	1 Week after Completion	1+Electronic
	7	Quarterly Status Reports for M&P	No	Quarterly	As required	1+Electronic

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
PA		**Parts**				
	PA-001	Product Assurance Plan				
	1	Final	Yes	Once	45 days ADC	1+ 1 Electronic
	PA-002	Parts Program Plan				
	1	Final	Yes	Once	45 days ADC	1+ 1 Electronic
	PA-003	Parts Data				
	1	Parts List – Initial	Yes	Once	3 Months ADC	1+1 Electronic
		Parts list – Update	Yes	As changes generated	1 Month after 1st release	1+ 1 Electronic
	2	Parts Status Reports	No	Bi-monthly	At PMR	1 + 1 Electronic
	3	NSPARs	Yes	As generated	3 Months ADC	1+ Electronic
	4	Waivers/Associated Backup Information	Yes	AR	4 Months ADC	1+ Electronic
	5	As Designed List	No	Once	1 month prior to PDR	1+ Electronic
	6	As Delivered and Tested List	No	Once	Two weeks prior to PSR for each item	1+ Electronic

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
QA		**Quality Assurance**				
	QA-001	Quality Assurance Plan and Documentation				
	1	Final QA Plan	Yes	Once	45 days ADC	1+ Electronic
	2	Product Inspection and Test Flow Charts -Final	No	Once	4 weeks prior to PDR	1+ Electronic
	3	Storage, Handling and Shipping Procedures -Final	No	Once	2 Weeks ARJC	1+ Electronic
	4	Workmanship Standards for Engineering Model and Flight Type Hardware	No	Once	With QA Plan	1+ Electronic
	5	Packaging Plan	No	Once	Updates, As Required	1+ Electronic
	6	Insp. Procedures/Specifications	No	Once	With QA Plan	1+ Electronic
	7	Rework Procedures and Repair Instructions	No	Once	With QA Plan	1+1 Electronic
	8	Discrepancy Reports	No	AR	Within 7 days of discrepancy	1+ Electronic
	9	Process Control Procedures	Yes	Once	with QA Plan/Specific 4 weeks before PDR	1+ Electronic
	10	Inspection and Test Plan	No	Once	With QA Plan	1+ Electronic

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
	QA-002	End-Item Data Package				
	1	Final	Yes	Once	2 Weeks Prior to PSR for each end item	1+ Electronic
	QA-003	Electrostatic Discharge (ESD) Control Plan				
	1	Final	No	Once	45 Days ADC, With QA Plan	1+ Electronic
	QA-004	Contamination Control Plan				
	1	Final	No	Once	With QA Plan	1+ Electronic
RA		**Reliability**				
	RA-001	Reliability Assurance Plan				
	1	Final	Yes	Once	45 days ADC	1+ Electronic
	RA-002	Reliability Data				
	1	Initial	Yes	Once	2 Weeks before PDR	1+ Electronic
	1	Final	Yes	Once	4 Weeks prior to EQM PSR	1+ Electronic

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
	RA-003	Problem/Failure Report				
	1	Initial	No	Once	Within 2 days of Occurrence	1+ Electronic
	2	Final	Yes	Once	Within 2 days of Contractor Closure	1+ Electronic
	RA-004	Structural and Thermal Design Models				
	1	Initial	No	Once	Within 2 days of Occurrence	1+ Electronic
	2	Final	Yes	Once	Within 2 days of Contractor Closure	1+ Electronic
RE		**Reviews**				
	RE-001	Review Plan	Yes	Once	45 days ADC	1+ Electronic
	RE-002	Inheritance/ Lessons Learned Review	No	Once	45 days ADC	1+ Electronic
	RE-003	Requirements Review	No	Once	45 Days ADC, With I/LL Review	1+ Electronic
	RE-004	Preliminary Design Review (PDR) Package	No	Once	10 working days before PDR 9 months ADOC	1+ Electronic
	RE-005	Critical Design Review (CDR) Package	No	Once	10 working days before CDR 16 months ADOC	1+ Electronic
	RE-006	Pre-Ship Review (PSR) Package	No	Once	10 working days before PSR	1+ Electronic

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
SA		**Safety**				
	SA-001	Safety and Health Plan				
	1	Final	No	Once	2 weeks ADC	1+ Electronic
	SA-002	Safety Plan - TWTA				
	1	Final	No	Once	45 days ADC	1+ Electronic
	SA-003	Illness, Incident and Injury Experience Reports	No	Each occurrence	48 hours after occurrence	1
TE		**Tests**				
	TE-001	TWTA (including TWT and HVPS) Test Plan				
	1	Final	Yes	Once	At PDR	1+ Electronic
	TE-002	TWTA (including TWT and HVPS) Test Procedures				
	1	Final - Functional/Performance/Acceptance Test Procedures	No	Once	2 weeks prior to test	1+ Electronic

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
		HVPS				
	2	Final - Functional/Performance/Acceptance Test Procedures	No	Once	2 weeks prior to test	1+ Electronic
		TWTA				
		Functional/Performance/Acceptance Test Procedures				
	3	Final	Yes	Once	4 Weeks prior to test	1+ Electronic
		Vibration/shock Test Procedure				
	4	Final	Yes	Once	4 Weeks prior to test	1+ Electronic
		Thermal Vacuum Test				
	5	Final	Yes	Once	4 Weeks prior to test	1+ Electronic
	TE-003	Test Data and Reports				
	1	Functional/Performance/Acceptance test Data and Reports	Yes	Once/test	4 weeks after test	1+ Electronic

CONTRACT DATA REQUIREMENTS LIST

DRD	ITEM	Title	JPL Approval Code	Frequency of Issue	Due Date	Copies
	2	Environmental Test Specification (ETSS)	Yes	Once/item and retest	4 Weeks prior to start of Tests	1+ Electronic
	3	Environmental Test Result Summary Form (TRSF)	No	Once/test	2 Weeks After Test	1+ Electronic
	4	Environmental Test Data and Reports	No	Once/test	4 weeks after test	1+ Electronic

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Configuration Management Plan	**CM 001** Page 1 of 1
USE The plan describes the activities necessary to assure proper configuration control, identification, and accounting during system design, fabrication, and assembly.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP DRD CM-002; DRD QA-001; DRD QA-002	REFERENCES D - 11096

PREPARATION INFORMATION

The Contractor prepared configuration management plan shall be in accordance with the requirements of D - 11096 with the following clarifications and additions:

1. The Contractor shall maximize use of the Contractor's existing configuration management system.

2. The plan shall specify any differences in control relative to flight hardware, engineering/flight hardware, and internal test equipment.

3. Drawings and specifications for the Ocean Vector Winds Mission Program shall be on Contractor format with Contractor numbers. Separate Drawing, Master Control Documentation List and specification trees shall be prepared.

4. Selected engineering documentation for the Ocean Vector Winds Mission Program will be reviewed and approved by JPL.

5. The Contractor shall maintain configuration control of all engineering documentation after release.

6. Special tooling and test equipment documentation shall be under Contractor configuration control after release.

7. Requirements for 'As Built Data' are specified in DRD QA002.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Engineering Documentation and Data List	**CM 002** Page 1 of 1
USE Constitutes the engineering documentation baseline for fabrication of Engineering Qualification Model (EQM) and Flight Model (FM) TWTAs.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP Contractor's Configuration Management Plan DRD CM-001	REFERENCES D - 11096

PREPARATION INFORMATION

Engineering documentation for **TWT, HVPS and TWTA**, consisting of drawings, specifications, and data necessary to procure, manufacture, inspect, test, and calibrate flight hardware and bench checkout equipment shall be prepared in accordance with the requirements of D - 11096 and DRD CM-001.

A data list shall be prepared in accordance with the requirements of D - 11096 for each JPL-identified configured item assembly (deliverable end item assembly).

Submittals under this item include:

1. A data list and revisions for each JPL identified 'Deliverable End Item Assembly'.

2. Electronic interface with JPL PDMS or via CD (as defined in D - 11096) of each **Major Subassembly** (note 1) drawing and associated list(s), listed in the data list, except JPL controlled drawings.

3. Electronic interface with JPL PDMS or via CD of the TWT and HVPS specification per TWTA Component Specification CS518574.

4. Electronic interface with JPL PDMS or via CD of all subsequent changes to the documents listed in paragraph 2 above, including all change authorization and implementation paper.

5. Copies of each document(s) listed in paragraph 2 above, except JPL controlled documents and government or nationally recognized industry documents.

6. Copies of subsequent changes (change paper and revised document) to the documents listed in paragraph 4 above.

Quality of these documents shall conform to the requirements specified in D - 11096.

Note 1: Major Subassembly is defined as a Replaceable Printed Wiring Board Assembly or a potted replaceable module.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Photographs	**CM 003** Page 1 of 1
USE Photographic record of hardware	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES

PREPARATION INFORMATION

Photographs shall be taken of TWT, HVPS and TWTA: (1) two or more views of each subassembly; (2) all sides of each assembly, and (3) all sides of the subsystem. Photographs shall be taken of the EQM, PFM TWTA, and Support Equipment. Photographs shall also be taken of Special Test Equipment, Special Tooling, test areas, test configurations, facilities as appropriate.

The hardware photographs shall show the placement of parts, routing of wires and cables, and the relationship of parts. When it is possible, the items shall be arranged so component serial numbers show. A size reference (e.g. ruler) shall be included in each photograph.

A master photograph list shall be generated and maintained. Eight inch by ten inch color copies and/or transparencies (viewgraphs) shall be delivered upon request by JPL. The Contractor shall deliver a full set of negatives to JPL with the corresponding End-Item Data Package.

The following information shall be supplied with each photograph/negative:

1. A concise title, accurately describing the subject matter photographed, including part number and serial number.
2. Project name (i.e., Ocean Vector Winds Mission).
3. Any internal files or contract numbers.
4. Date photographed.
5. Where photographed.

Photographs may be delivered in electronic form as TIFF encoded images with a resolution, sufficient to render appropriate detail.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Interface Circuit Data, Interface Circuit Drawing and Grounding Diagram	**DS 001** Page 1 of 1
USE To define and document the specific interface circuits to be utilized between the TWTA and Ocean Vector Wind Mission Scatterometer.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP CM-002	REFERENCES

PREPARATION INFORMATION

The Contractor shall prepare and deliver a listing and a detailed schematic of each TWTA and OVWM interface circuit TWTA internal grounding schematic. Sufficient detail shall be provided such that both the driving and receiving interface impedance can be determined by the user. The Interface Circuit Data shall include, but not necessarily be limited to, the following:

1) Schematic description of sending and receiving "end circuits":
   a) Sending end-circuit source voltage and impedance.
   b) Receiving end-circuit input filter/clamps and first active device.
   c) Grounding and isolation of end-circuits and their excitation power supplies or levels.
   d) Interface circuit ground tree reference.

2) Other Information:
   a) Function name.
   b) Expected waveform on interface.
   c) Signatures, revision status and ECR numbers.

The Contractor shall also prepare a grounding diagram (or schematic) that identifies all electrical connectors and their respective pins that are connected to chassis ground within the TWTA. The grounding diagram shall include, but not necessarily be limited to, the following:

1) The initial starting point shall be at all of the TWTA enclosure external connectors. The grounding diagram shall then traverse internal to the TWTA enclosure through all other electrical connectors to chassis ground.

2) The grounding diagram shall identify, within a given subassembly or module, that a ground point exists. When multiple grounds exist at a single ground point, this fact shall be defined.

JPL and the Contractor will work together via the Interface Working Group to complete the JPL controlled OVWM/TWTA Interface Circuit Data Sheets (ICDS), grounding diagrams, and interface circuit drawings.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Interface Control Drawing	**DS 002** Page 1 of 1
USE To define and document the specific mechanical and thermal interface between the TWTA and Ocean Vector Wind Mission Scatterometer.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES D-8208

PREPARATION INFORMATION

The Contractor shall prepare a mechanical interface drawing that includes configuration and interface dimensional data applicable to the envelope mounting and interconnection of the TWT and HVPA to the Scatterometer. The drawing shall include as a minimum, but is not limited to the following:

- Maximum physical envelope and overall dimensions (length, width, height) of assembly.
- Mounting requirements for installation and thermal control including hole pattern, clearance hole diameter, contact surface area, flange thickness, surface finish, mounting surface flatness, and interface surface preparation.
- Mounting fastener size/grade and torque requirements.
- Mechanical and electrical interfaces to the OVWM.
- Location of all external connections dimensionally referenced to a designated reference hole agreed upon by JPL and the Contractor.
- Connector pin out and function of the connection.
- Mass and cg locations relative to the mounting surface and reference hole.
- External cable bend radius envelope and access/handling constraints.
- Provisions for case electrical bonding connections and electrical resistance requirements.
- Special physical handling, precautionary notes and warnings.
- Location of nameplate information for part and serial number, drawing number and revision letter.

JPL and Contractor will work together via the Interface Working Group to complete the reference designations, applicable tolerances and physical data.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Packaging Qualification Verification Documentation (Thermal Cycling)	**ER 001** Page 1 of 1
USE	PROGRAM
The purpose is to verify that all hardware designed and built for the OVWM mission application possesses sufficient fatigue life to survive the induced thermal and/or power cycling environment occurring during all mission phases including ground operations, testing, and flight operations.	Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES
	D-8208

PREPARATION INFORMATION

PREPARATION INFORMATION:
Format: Contractor defined format is acceptable pending approval by JPL.

Content: Packaging Qualification Verification Documentation will include the following

1.) Thermal Cycling Qualification Assessment Report (for new and heritage designs) including:
   a.) A detailed summary of the number of thermal cycles required for all hardware elements (typically electro-mechanical interconnects, such as solder joints, wire bonds, via's, etc.) subject to low cycle fatigue or thermally induced fatigue. Inclusive in this summary are all thermal exposures due to power cycling or variation in the thermal control surface occurring post-formation thru end-of-mission.
   b.) A detailed description of all the hardware elements indicating the type of packaging used (photo's, drawings, etc.).
   c.) Qualification status of all hardware elements (i.e. needs to be tested, qualified by previous test etc.).
   d.) Copies of any data for which inheritance is being claimed (test reports, etc.)

2.) Test Plan for any new qualification to include as a minimum:
   a.) Test Objective
   b.) Pre-Assembly Material Inspection
   c.) General Description of Assembly Operations
   d.) Test Setup
   e.) Test Measurements
   f.) Test Equipment
   g.) Post Thermal Cycling Inspection

3.) Test reports for any new qualification to include as a minimum:
   a.) Abstract of Test Results
   b.) Test Description
   c.) Detailed Test Results
   d.) Pictures of Test Setup (Hardware and Test Equipment)
   e.) Pictures of electrical interfaces where possible
   f.) Pictures of X-Rays where applicable (Ball Grid Array solder balls) Include inspection rationale/criteria of balls.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Work Breakdown Structure (WBS) and Dictionary	**MA 001** Page 1 of 1
USE To establish the framework and Baseline for Work Force and Schedule Reporting.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP Correlation with the Baseline Cost Estimate (MA 002) and Network Schedules (MA 003)	REFERENCES

PREPARATION INFORMATION

The Work Breakdown Structure (WBS) and Dictionary establishes the basic framework within which all effort necessary to meet the requirements of the Contract are identified and defined. They provide the logical structure for planning and controlling costs. It shall be presented in both tabular and graphic form and shall be product-oriented.

The lowest level of the WBS shall correspond to at least the module level at which work scheduled and actual costs can be compared. The WBS shall be coded to establish the relationship among all of its levels. The established WBS coding shall be used to identify each particular WBS item on all cost estimates, network schedules, and financial reports. The WBS shall indicate which items require monthly financial reporting.

A WBS Dictionary shall be prepared to define each item of the WBS. These definitions shall describe the work to be performed, the criteria for completing the work, the organization responsible for the work and the major deliverable(s) involved (if applicable).

After initial approval, the WBS and Dictionary shall be modified only with the prior consent of JPL.

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Baseline Cost Estimate	**MA 002** Page 1 of 1
USE To establish the cost and schedule plan.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP Correlation with Work Breakdown Structure (MA-001), Detailed Schedules (MA-003)	REFERENCES

PREPARATION INFORMATION

The Baseline Cost Estimate is a time-phased cost plan for the entire length of Contract performance. It is the key element of financial planning and management of the Contract. The Contractor shall prepare Baseline Cost Estimates at the lowest levels of the WBS. These shall be summarized at successively higher levels of the WBS and at the total project level. A Baseline Cost Estimate shall be submitted to JPL for each WBS work item.

Each estimate shall be broken out by element of cost and summarized through total cost. It shall also be time-phased by month and subtotaled by government fiscal year, and then totaled for the entire period of performance.

The initial Baseline Cost Estimate for the total project shall equal the original negotiated Contract cost less any management reserve. All negotiated changes to the scope of the Contract shall be incorporated into the Baseline Cost Estimate. On occasion, authorized but unnegotiated changes to the Contract may be incorporated into the Baseline Cost Estimate with JPL approval.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Detailed and Summary Schedules	**MA 003** Page 1 of 1
USE To provide current information for schedule planning.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP Correlation with WBS (MA 001) and Baseline Cost Estimate (MA 002)	REFERENCES

PREPARATION INFORMATION

The Contractor shall prepare schedules that portray the plan for accomplishing all of the activities necessary to meet contractual requirements within the time constraints imposed by the performance and delivery schedule of the Contract. All schedule activities shall be cross-referenced to the WBS. Interdependencies of the schedule tasks will be identified. A distinctive marking shall identify activities that fall on the "critical path".

The initial schedules shall show the planned start and completion dates. Monthly updates to the schedules shall, in addition to showing the planned dates, reflect any progress the Contractor has made toward accomplishing the schedule activities, and any projected changes to the planned start and completion dates.

The Customer, JPL, requires the Contractor to develop and maintain an Integrated Master Schedule (IMS) In Microsoft Project 2000. The IMS shall include Level 1 through Level 4 milestones and other events planned to meet specified delivery dates. The IMS shall include Logic Network Schedule visibility into all aspects of the development showing the major milestones and events, including receipt of Buyer-Furnished Equipment/Information (BFE/BFI and Government-Furnished Equipment/Information (GFE/GFI). The Contractor shall provide a weekly status and a monthly update to the IMS. The weekly status is due to the Customer by the close of business each Friday. The monthly IMS update is to include an MS Project 2000 file sent electronically to the Customer, and will be due by the 10^{th} calendar day of each month. If the 10^{th} calendar day falls on a Saturday, Sunday or holiday, the reporting shall be accomplished by the next business day. The Contractor shall include a list of all changes in milestone status (e.g., schedule slippage or re-plan) along with the reason for change and anticipated impacts.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Periodic Management Review (PMR) Package and Weekly Status Report	**MA 004** Page 1 of 1
USE To keep the JPL and Contractor management informed on a monthly and weekly basis of current accomplishments and of major problems that require management assistance, resolution, or action to resolve or eliminate the identified problems	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES

PREPARATION INFORMATION

PMR PACKAGE

The Contractor shall prepare and hold a Periodic Management Review (PMR) with an agenda mutually agreed-upon in advance with the JPL CTM and Negotiator. In the oral presentations, the Contractor Project Manager shall address overall progress issues, with each lead engineer presenting his/her detailed technical, schedule, and material/subcontracting reports. A PMR Package shall be prepared and presented to JPL at the PMR. The contents of the package shall include, but not be limited to, the following information:

- Schedule, cost, and workforce status against plan
- QA Status and issues
- Parts status per PA-003
- Action plan to address any problems
- Contractual issues/Technical liens
- Major accomplishments met and missed
- Technical Progress
- Major issues and concerns (risk item identification)
- Status against technical requirements
- Status of Procurements (Subcontracts and materials)
- Waivers
- Pending or late JPL items
- Action item status
- PMR report and Plans for next month

WEEKLY STATUS REPORT

Each week, the Contractor shall prepare and submit via e-mail, to the CTM and Negotiator, a concise weekly status report, with the exception of the week in which the PMR occurs, with the following information:

- Accomplishments/schedule status. Identify progress versus planned accomplishments for the past week and any major (to JPL) status of activities and anticipated changes in schedule milestones, rationale for missed milestones, and specific actions to prevent impact to the critical path.
- Problem status. State progress toward solving or averting problems previously identified. Discuss new major problems identified during the past week and any actions by or assistance from Contractor's management or JPL. Identify potential problem areas and recommend actions for JPL.

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Internal Audit Findings Report	**MA 005** Page 1 of 1
USE To report corrective or preventive action taken to eliminate the causes of actual or potential non conformance to contract requirements.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES

PREPARATION INFORMATION

The contractor shall report any internal audit findings; risk items or deviations that have been determined to potentially affect mission success.

This report shall include, but not be limited to, the following:

A. The effective disposition of concerns and reports of product non-conformance.

B. Investigation of cause of non-conformance related to products and processes.

C. Determination of corrective action needed to eliminate the cause of the non-conformance.

D. Application of controls to ensure that corrective action is taken and that it is effective.

E. Appropriate close-out signatures, including the Cog Engineer and the Contractor's Project Manager.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Materials and Processes Control Plan	**MP 001** Page 1 of 1
USE To define the materials and processes control activities.	PROGRAM Ocean Vector Winds Mission Traveling Wave
INTERRELATIONSHIP RA-001, QA-001	REFERENCES D - 11151

PREPARATION INFORMATION

This plan describes the material and process controls that the Contractor is using.

The plan shall include the following:

1) Identification of all M&P covered by the M&P Plan in particular encapsulation of high voltage transformer and assemblies and any special precaution taken to separate encapsulating areas.

2) Identification of all affected organizations, both within and external to the Contractor, including organizational responsibilities, relationships and identification of key managerial, programmatic and technical personnel.

3) Methodology for implementing all requirements of JPL D - 11151.

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Material and Processes Data	**MP 002** Page 1 of 1
USE To provide materials and processes data for the proposed designs.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES D - 11151

PREPARATION INFORMATION

The Contractor shall submit technical data as defined by the Materials and Processes Control Plan, which covers material and processes selection, qualification, specifications and use. These data submittals shall meet the requirements of D - 11151 and consist of the following:

1) Materials Identification and Usage Lists (MIUL) for organic materials, inorganic materials, process and lubricants. These lists shall include nomenclature, expected environment and application, process description, and material/process specifications.

2) Materials Usage Agreements (MUA), as required, for all materials and processes that do not meet the requirements of JPL D - 11151.

3) Qualification plans and associated data for nonstandard M&P design items.

4) Contractor developed material and process controlling documentation and specifications.

5) Waivers pertaining to material and/or process issues, and all associated backup information.

6) Failure analysis reports involving material and/or process issues.

7) Quarterly status reports for all Materials and Processes (M&P) activities including MIUL/MUA submittals/reviews, nonstandard design items/qualification plans, waiver processing, materials and processes issues/resolutions, failure analysis results, response to GIDEP alerts. May be included in submittals identified in MA.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Product Assurance Plan	**PA 001** Page 1 of 1
USE To define the requirements of a Product Assurance Plan	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES

PREPARATION INFORMATION

The OVWM Mission Assurance Requirements in referenced in Exhibit I serves as the master Mission Assurance requirement documents for the Project and describes the required assurances activities.

The Contractor can meet its requirement by using one of the following options:

(1) The Contractor's current standard practices and existing plans, as approved by JPL.
(2) A Contractor prepared amendment to the Contractor's current standard practices and existing plans.
(3) As a last option, a completely new Contractor prepared plan that meets the requirements of the referenced JPL Documents for the Contract in Exhibits I and III.

The document(s) submitted by the Contractor will be reviewed by JPL to verify that they meet the intent of the JPL requirements. The Contractor's documents, as approved by JPL, will become the applicable documents for the Contract.

Any changes to these plans after initial JPL approval must be approved by JPL.

The plan shall address the following topics:

A. System Safety
B. Safety and Health
C. Reliability Assurance
D. Problem/Failure Tracking and Reporting
E. Environmental Assurance
F. Quality Assurance
G. Electrostatic Discharge Plan
H. Workmanship Standards/Handbook
I. Electronics Parts Program
J. Materials and Processes
K. Contamination Control (per technical specification requirements)
L. Configuration Management

The CDRLs and DRDs call out several plans as submittals: CM001, MP001, PA002, QA001, RA001. At the contractor's discretion they may generate either a single Product Assurance Plan that addresses all of the DRD requirements or individual plans that address the DRDs separately.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Parts Program Plan	**PA 002** Page 1 of 1
USE To define the parts control activities.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RA-001, QA-001	REFERENCES JPL D - 10829

PREPARATION INFORMATION

This plan describes the part controls that the Contractor shall use.

As a minimum the Parts Program Plan shall:

1) Identify all hardware covered by the parts program.
2) Identify all key material, programmatic and technical personnel and their organizational responsibilities and relationships in regard to parts specification, procurement/manufacturing, and processing for all affected organizations within and external to the Contractor.
3) Define parts radiation (TID & SEE), life and other environmental requirements.
4) Identify parts selection sources, parts acquisition policies/procedures, and parts application requirements.
5) Identify and provide a schedule of all parts program activities, including role in Periodic Management Reviews, parts list releases (preliminary, updated, as-designed, and as-built), part procurements and parts data/application analyses.
6) Describe the use and approval of Non-standard Part Approval Requests (NSPAR's) and part time waivers.
7) Define the parts failure analysis reporting and analysis requirements.
8) Define the methodology to be employed to address parts issues identified on GIDEP Alerts.
9) Demonstrate compliance to JPL D - 10829 requirements for applicable hardware.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Parts Data	**PA 003** Page 1 of 1
USE To provide parts data for the proposed designs.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP PA-001	REFERENCES JPL D - 10829

PREPARATION INFORMATION

The Contractor shall submit technical data as defined by JPL D - 10829 and the Contractor's Parts Program Plan, developed in accordance with DRD PA-001, which covers item selection, application status and problems/concerns during selection, procurement, design/development, fabrication and testing.

These data shall consist of the following:

1) Parts lists of all parts used in the TWTA, including those used in hardware procured from subcontractors and vendors, consisting of:
   a) Preliminary design lists (includes manufacture part number, generic part number, proposed manufacture, procurement specification, screening/demonstration/upgrade specification, applicable NSPARs/waivers with revision letter and status, and quantities used.
   b) As-designed lists (same information as preliminary design lists).
   c) As-built lists (same as as-designed list with the following additional information:
      1) Actual part number and revision letter of each item.
      2) Reference designation where each part is used.
      3) Serial number of part (if serialized).
      4) Screening/demonstration/upgrade lot number, as applicable.
      5) Manufacture lot date code.
      6) Traceability number as applicable.
      7) Serial number and part number of the next assembly into which the part is installed.

2) Periodic status reports for all electronic parts program activities, including parts list submittals/reviews, NSPAR/waiver processing, part procurement status, issues/resolutions, failure analyses results, response to GIDEP alerts, and all test results (screening, demonstration, upgrade, TID & SEE).

3) Non-standard Part Approval requests (NSPARs) and all associated procurement and screening/demonstration (test) documentation.

4) Waivers and all associated backup information.

5) Failure Analysis Reports.

6) Contractor prepared parts specifications.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Quality Assurance Plan and Documentation	**QA 001** Page 1 of 1
USE To provide documents defining in detail the Contractors quality assurance activities conducted in support of the Statement of Work tasks for flight-type hardware and in compliance with requirements of JPL D - 11141. The plans shall be the directive documents for all of the Contractor's QA-associated activities for flight-type hardware.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP CM 001, MP 001, PA 001, PA 002, QA 002, QA 003, QA 004, RA 001, RA 002, RA 003, SA 001, and SA 002.	REFERENCES D - 11141

PREPARATION INFORMATION

1) The Project QA plans for the flight-type hardware shall be generated in accordance with and shall present all Quality Assurance activities in support of the tasks defined by the Statement of Work.

2) Quality Assurance documentation and data as required by the JPL approved Quality Assurance Plan. The documentation as a minimum shall contain the following items.

   a) Final QA plan incorporating all JPL requested changes.
      1. Narrative explanations of the QA systems, including methods used, when they are applied, and who performs them.
      2. Charts and narrative statements describing the functions, responsibilities, and relationships of each element in the Contractor's organization that implements the quality program, including procurement, engineering, fabrication, test, and quality control.
      3. A description of QA requirements for and monitoring of subcontractors.
      4. A description of the Contractors Material Review Board (MRB) process.
      5. A description of the Problem Failure Reporting (P/FR) Processes.

   b) Documents Submitted for JPL Approval
      1. Product Inspection and Test Flow Charts
      2. Storage, Handling and Shipping Procedures
      3. Hardware Travelers
      4. Workmanship Standards for/Engineering model and Flight-Type Hardware
      5. Sampling Plan
      6. Manufacturing Operations Sheets
      7. Packaging Plan

   c) Documents Submitted for Review
      1. Training Plans
      2. Inspection Procedure/Specifications (including incoming inspection procedures).
      3. Rework Procedures and Repair Instructions
      4. Discrepancy Reports
      5. Procedures Implementing the QA Plan
      6. Workmanship Standards for Non-Flight Hardware
      7. Procedures Implementing the Inspection Plan

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
End-Item Data Package	**QA 002** Page 1 of 2
USE To document the design, fabrication, assembly, integration, and test history of the TWTA deliverables.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP QA-001	REFERENCES PD 686-014 D - 11141 D - 11096

PREPARATION INFORMATION

An End Item Data Package shall be prepared for each controlled assembly (configured item assembly). The Contractor determines the format of the data package. The contents of the package include, but are not limited to, the following information:

1) As tested and delivered data for all flight hardware and software. 'As built' documentation is a compilation of items describing exactly the configuration of a fabricated serialized assembly, including:

Hardware:

a) Part number and revision letter of each item.
b) Part description (title) of each item.
c) Electronic part reference designation.
d) Serial number of each item, or if no serial number, the screening lot number when required.
e) Screening/demonstration/upgrade lot number, as applicable.
f) Procurement specification or source control drawing (SCD), number and SCD Rev letter.
g) Generic part number.
h) Manufacturer.
i) Applicable NSPAR and Waiver numbers (with latest revision letter).
j) Manufacturer lot date code.
k) Traceability number, as applicable (waiver and wafer lot number).
l) Serial number and part number of the next assembly level into which the part is installed.
m) A Materials Identification and Usage List (MIUL)

Note: Data required in item 1 shall be submitted electronically and shall include vendor as-build data for hybrids and procured sub-assemblies.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
End-Item Data Package	**QA 002** Page 2 of 2

PREPARATION INFORMATION (continued)

2) A complete shortage list (parts and activities, as applicable).
3) Operating time data on all major assemblies and time sensitive items.
4) Number of operations for operationally limited items.
5) A complete list of the tests and test results performed at module, sub-assembly and assembly, with test data (last acceptance test at each level as a minimum) organized and indexed to the list.
6) A summary list, including open or closed status, of all P/FR's generated against the deliverable.
7) A summary list, including open or closed status, of all MRB actions generated against the deliverables.
8) A summary list, including open of closed status, of all ECR's written against the deliverables.
9) A summary list of all deviations and waivers applicable to the deliverable item.
10) Configuration Assembly Log (for both hardware and software as applicable).
11) Removal/re-installation record (not applicable for support and test equipment).
12) Evidence of acceptance by Contractor QA.
13) Test results summary (for both hardware and software as applicable).
14) Environmental test reports (on test environment) including JPL ETSS and TRSF forms.
15) Vendor/manufacturer parts and material certification forms and detail data, as applicable.
16) Top assembly drawing.
17) Unique instructions for safety, handling, packaging, storage, or shipping (as applicable).
18) A copy of all action items generated against the equipment, including open and closed status.
19) Completed HRCR documentation.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Electrostatic Discharge Control Plan	**QA 003** Page 1 of 1
USE To define the electrostatic discharge (ESD) controls to be applied in the fabrication and handling of flight hardware.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP QA-001	REFERENCES JPL D-1348

PREPARATION INFORMATION

This document describes the plans and procedures to be used for the protection of electrostatic-sensitive flight parts, subassemblies, assemblies and subsystems during all phases of the Contract.

The plan makes maximum use of the Contractor's existing and current ESD requirements and control practices appropriate for the static-sensitive levels of hardware, as determined by the Contractor. The plan shall meet the intent of JPL D-1348.

The plan includes the following discussions:

1. Procurement of static-sensitive parts and hardware.
2. In-house ESD controls and practices.
3. Organizational responsibilities and functions in implementing ESD requirement.
4. Maximum static voltage and humidity level allowed during kitting, assembly, and integration and test.

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Contamination Control Plan	**QA 004** Page 1 of 1
USE To define the design approaches and procedures employed to assure that the contamination control requirements are satisfied.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES D - 11312

PREPARATION INFORMATION

The plan makes maximum use of the Contractor's existing and current contamination control plan and contamination practices, as determined by the Contractor.

The plan includes the following:

1) The design approaches and procedures used to assure that effects due to contamination will not adversely affect performance.
2) Identification of any contamination sensitive hardware and operations.
3) Controls and monitoring in place to mitigate contamination risk.
4) Identification of procedures and processes which must be developed to ensure contamination control.

Note that contamination control will be accomplished by procedure and process control (QA) only; no contamination acceptance criteria will be employed.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Reliability Assurance Plan	**RA 001** Page 1 of 1
USE To provide a document defining in detail the Contractor's Reliability Assurance Program and required reliability assurance data in compliance with the requirements of D - 10957. The plan shall be the directive document for all the Contractor's activities associated with reliability assurance.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RA-002, RA-003	REFERENCES JPL D - 11096 JPL PD-686-031 JPL PD-686-033 JPL D-4686 JPL D-5703

PREPARATION INFORMATION

The Contractor shall prepare a Reliability Assurance Plan consistent with the Reliability Assurance requirements in D - 10957 and Mission Assurance requirements referenced in Exhibit I and III. The plan shall describe the Contractor's reliability assurance activities, including references to applicable Contractor's institutional policies, procedures, specifications, and instructions. It shall also include the following:

A. Title page, including provisions for sign-off by (1) Contractor's Reliability Assurance Manager, (2) Contractor's Program Manager, and (3) JPL Contract Technical Manager.
B. Document Change Log.
C. Table of Contents.
D. List of applicable documents.
E. A description, including appropriate charts, of the reliability assurance organization, management, and responsibilities for accomplishing the various activities; and relationships to the elements of the Contractor's organization and its institutional organization.
F. A schedule of reliability assurance activities indicating their phase relationships with design, development, procurements, design reviews, hardware reviews, fabrication, system testing, and shipment.
G. A description of responsibilities and techniques for accomplishing reliability assurance activities by or with subcontractors and suppliers.
H. A description of how the Contractor will impose all requirements by appropriate documents on all subcontractors and suppliers.
I. A description of the assumptions and preparation guidelines to be followed in generating the Reliability Analyses to be delivered per DRD RA-002. These guidelines shall comply, wherever possible, with JPL D-5703, "Jet Propulsion Laboratory Reliability Analyses Handbook." Or JPL approved equivalent.
J. A description of plans to implement the Problem/Failure Reporting (P/FR) requirements and procedures of D - 10959.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Reliability Data	**RA 002** Page 1 of 1
USE To provide data for review and evaluation of design status and progress.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RA-003	REFERENCES JPL D-5703 JPL D - 10957

PREPARATION INFORMATION

Data to be submitted, as defined by the approved Reliability Assurance Plan (DRD RA-001) and in accordance with JPL D-5703, shall include the following analyses:

1. Failure Modes, Effects, and Criticality (including a single failure point summary).

2. Derating Guidelines and values.

3. Worst Case Temperature analysis.

4. Worst Case Circuit Analysis (WCA)
   As a minimum the WCA shall include:

   - Supporting Schematics and Interconnections
   - Upper/low limits on parts
   - Power Dissipation distribution
   - Loop analysis for each regulator loop.

5. Stress Analysis (including Schematics)
   a) Electrical and Electromechanical parts
   b) Structural
   c) Thermal
   d) Electric field Analysis, specifically around High voltage components, and Modules and Transformer which generate high voltage or float at high voltage.

6. Single Event Effects (SEE)

7. Risk Assessment (Ref.: D - 10957; Paragraph 3.3.7)

8. Protective and Redundant Devices/Circuits (Ref.: D - 10957: Paragraph 3.4).

The above analyses shall address the TWT, when applicable. Specifically cathode temperature, Grid step to meet life and End of Life power requirements.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Problem/Failure Reports	**RA 003** Page 1 of 2
USE	PROGRAM
To provide JPL with timely notice of problems or failures with the deliverable hardware and Contractor's equipment. Also, to provide JPL with the data necessary to assess the adequacy of the analysis and corrective action so as to prevent recurrence of problems/failures and to assess the residual risk following corrective action.	Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES
SA-001, SA-003	JPL D - 10959

PREPARATION INFORMATION

Each report shall be submitted in accordance with the JPL approved Reliability Assurance Plan DRD RA-001, and shall be responsive to the requirements of D - 10959. Each report shall include, but not be limited to, the following:

A. Complete identification of the hardware;
B. Date the problem/failure occurred;
C. Estimated accrued operating hours and/or cycles at the time the problem/failure occurred;
D. Location of the hardware when the problem/failure occurred;
E. Hardware environmental conditions when the problem/failure occurred;
F. Test/operation being performed;
G. A description of the problem/failure incident and the potential impact on the subsystem functional performance;
H. A description of the problem/failure analysis, including impact on hardware;
I. Cause of the problem/failure;
J. A description of the corrective action taken;
K. A description of the method used to verify that the corrective action was effective;
L. Safety rating;
M. Supporting material shall be provided to allow JPL to perform the mission risk assessment;
N. Appropriate close-out signatures, including Contractor Product Assurance Manager, and for potential Red Flag P/FRs, the Contractor's Project Manager.

The P/FR system shall be in effect when the Engineering Model sub-assemblies are completed and ready for test. During the Engineering Model test phase the P/FR will be designated as Development P/FRs unless they affect design, fabrication or Test of flight hardware.

The P/FR summary shall contain the following information for all hardware:
1) Part 1, which lists P/FRs by component and includes for each P/FR:

a) The P/FR identifying number,
b) The data the problem/failure occurred,
c) The location of the hardware when the problem/failure occurred,
d) A short summary description of the problem/failure,
e) Status of P/FR (open or closed),
f) Preliminary failure effect and risk rating for P/FRs open longer than 60 days, and

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Problem/Failure Reports	**RA 003** Page 2 of 2

PREPARATION INFORMATION

g) The failure effect rating and risk rating for closed P/FRs (with Red-Flag P/FRs identified). Rating shall apply to P/FR which affect flight hardware.

2) Part 2, which lists for each assembly as a whole:

a) Total number of P/FRs initiated,
b) Total number of closed P/FRs,
c) Total number of Red-Flag P/FRs,
d) Total number of P/FRs open longer than 60 days, and
e) Total number of P/FRs closed since last report.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Structural and Thermal Design Models	**RA 004** Page 1 of 1
USE Defines the structural and thermal mathematical designs for the TWTA and supporting documentation.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES JPL D-4686 JPL D - 11096

PREPARATION INFORMATION

The Contractor shall provide the following models:

(1) Detail thermal design model of the TWTA in SINDA format.

(2) Reduced thermal model limited to 30 nodes of the detail model in SINDA format.

(3) Finite element model FEM) of the TWTA structural design in MSC/NASTRAN format

AR As Requested ADC After Date of Contract or Letter Contract ARJC After Receipt of JPL Comments

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Review Plan	**RE 001** Page 1 of 2
USE To document the TWTA Program (including TWT and HVPS) review activities.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RE-002, RE-003	REFERENCES JPL D-4686 JPL D - 11096

PREPARATION INFORMATION

The following applies to the TWT, HVPS and TWTA (includes a major subcontractor, if used).

This plan describes the Contractors plan for conducting requirements, inheritance, design, test readiness, pre-ship, and delivery reviews.

JPL intends that the Contractor make maximum use of existing and current review strategies which are equivalent to and meet the intent of the JPL requirements contained within D-4686, D - 11096, RE-002, RE-003.

At a minimum, the plan should address the Contractor's plans for the following reviews:

1) Inheritance/Lessons Learned Review (as applicable)
2) Requirements Review
3) Preliminary Design Review
4) Critical Design Review
5) Pre-Ship Review (at Contractor's facility)

For each of the reviews, the plan should, at a minimum, address the following (as applicable):

1) Purpose of the review
2) Formality
3) Review Board members and responsibilities
4) Typical agenda
5) Content of data package vs. presentation material
6) Review protocol pertaining to:
   a) Distribution of data packages
   b) Generation of formal minutes
   c) Disposition of RFA's
   d) Tracking and close-out of Action Items
   e) Nominal schedule for the above items
7) Use of the End Item Data Package (as applicable)
8) Use of the JPL HRCR forms (as applicable)

It is also intended that the Contractor include a filled-out HRCR form (as appropriate) in the TWTA Pre-Ship Review data package/presentation material so that a preliminary assessment of "delivery readiness" can be made against the HRCR criteria prior to shipment.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Inheritance/Lessons Learned Review	**RE 002** Page 1 of 2
USE To provide a mechanism to validate the heritage of existing hardware designs (TWT and HVPS) for possible use in the Ocean Vector Winds Mission, TWTA and to review/discuss the lessons learned for this hardware.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RE-001	REFERENCES JPL D-4686 JPL D - 11096

PREPARATION INFORMATION

The Contractor shall conduct an Inheritance/Lessons Learned (I/LL) Review for all existing designs/hardware which are proposed for use as part of the TWTA (including TWT and HVPS) and Contractor's non deliverable Support Equipment.

The objectives of the review(s) are to:

1. Verify compatibility of the inherited designs/hardware with the OVWM TWTA flight requirements and the OVWM Product Assurance Requirements.

2. Determine if the inherited design/hardware is capable of meeting the requirements.

3. Identify potential risk associated with the inherited design/hardware and the proposed usage.

The Inheritance/Lessons Learned Reviews are considered to be informal. They will however, require formal presentations addressing the review agenda items listed below:

1. Description of what is inherited.

2. Design and EQM/flight Requirement
   - A. Prior Requirements Comparison to TWTA Requirements
     - i. Classification
     - ii. Functional
     - iii. Interface
     - iv. Environmental
   - B. Summary of Differences

3. Product Assurance
   - A. Quality Assurance
     - i. Where was the equipment built?
     - ii. QA requirements and Workmanship Standards applied
     - iii. Documentation Status
     - iv. Hardware Condition (if existing)
     - v. Hardware liens

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Inheritance/Lessons Learned Review	**RE 002** Page 2 of 2

PREPARATION INFORMATION (continued)

- B. Reliability Assurance
  - i. Reliability Analysis Performed and Results (WCA, E-field, phase/Gain margins etc.)
  - ii. Extent of Independent Review of Reliability Analyses
  - iii. Problem Failure System uses
  - iv. Summary of all P/FRs
  - v. Risk assessment of P/FRs
  - vi. Waivers for non-compliance
- C. Environmental Verification
  - i. Tests performed (enviroments, levels and durations) and results
  - ii. Analysis performed in lieu of test
  - iii. Waiver for non-compliance
- D. Parts
  - i. Parts classification
  - ii. Parts list for the Heritage Hardware of Design
  - iii. Parts Specifications used for the Heritage Hardware or Design
  - iv. Heritage parts availability
  - v. NSPARs and Waivers documenting use of non-standard parts and waivers of parts requirements
  - vi. Parts deratings
  - vii. Total dose radiation and SEE/SEL Parts Requirements
  - viii. Other parts control requirements
- E. Material and Processes
  - i. Materials and Processes Requirements
  - ii. Standards/Controls used
  - iii. Applicable material specialist reviews
  - iv. Packaging Design and Conformal Coating
  - v. Non-compliance waivers
- F. Configuration Control
  - i. “Design” compared to “As Delivered and Tested Data List”
  - ii. Design Change Control Requirement
  - iii. Project phase when change control initiated
  - iv. Design release and change control authority
  - v. Design requirements waivers

4. Design Status
   - A. What design changes made since qualification?
   - B. What design changes are planned for OVWM since previously flown?
   - C. What design changes require qualification to meet OVWM requirements?
5. Relevance of Flight Experience
   - A. Equipment Functional Criticality
   - B. Level of redundancy in application
6. Failure History
   - A. Performance history
   - B. Failure trends
   - C. Adequacy of P/FR Closures
7. Lessons Learned

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Requirements Review	**RE 003** Page 1 of 1
USE To review the TWTA design, and performance requirements imposed upon the Contractor, to assess the Contractors understanding and interpretation of the requirements, and to assess the Contractors expected compliance against requirements.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RE-001	REFERENCES

PREPARATION INFORMATION

The Contractor shall conduct a Requirements Review with the following objectives:

1) Review and discuss the TWTA requirements and requirements allocation to the HVPS & TWT.
2) Assess the Contractor's understanding and interpretation of the requirements.
3) Assess the Contractor's expected compliance to the TWTA requirements.
4) Identify the driving or high risk TWTA requirements.

It is intended that this review be informal; however, formal presentations will be required.

[JPL intends that the Contractor present their interpretation and expected compliance of the requirements imposed by JPL. Emphasis should be placed upon the requirements contained within Exhibits II and III but the Contractor should also address the other requirements contained within the Primary Controlling and Lower Tier Applicable Documents as necessary to demonstrate a thorough understanding of the major requirements.]

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Preliminary Design Review (PDR)	**RE 004** Page 1 of 1
USE To review the TWTA design and readiness of the Contractor, to proceed with detail design. To assess the Contractors progress, interpretation of the requirements, and to evaluate any risk in order to proceed to build the engineering model.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RE-001	REFERENCES

The Contractor shall conduct a Preliminary Design Review with the following objectives:

1. Review Project Planning and Status.
2. The preliminary designs and processes meet the requirements and are sufficiently defined, documented, and controlled to proceed with the detail design
3. Summary of the results from previous reviews, including the status and resolution of action items.
4. Risk assessment.
5. The design analysis is sufficiently complete to proceed.

The Preliminary Design Reviews are considered to be informal. They will however, require formal presentations. Each review shall include, but not be limited to, the following:

1. Preliminary electrical, mechanical, structural, and thermal design.
2. Design prototype test results.
3. Requirements traceability and compliance matrix.
4. Configuration and design of all hardware, including block diagrams and flow diagrams.
5. Function and performance as compared to requirements, including cost.
6. Performance margins relative to required performance (e.g., mass, power).
7. Design prototyping results.
8. Parts and long lead item status.
9. Conformance to environmental design, product quality assurance requirements.
10. Interface design.
11. Design trade-offs, alternatives, and selection basis.
12. Safety analysis, including analyses of structural stress, fracture control, and thermal properties.
13. Reliability analyses (e.g., stress, worst case, FMECA).
14. Radiation susceptibility analysis and design.
15. Compatibility with safety, maintainability, availability, operability, reliability, and quality assurance objectives.
16. Preliminary manufacturing process design.
17. Preliminary integration and testing approach.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Critical Design Review (CDR)	**RE 005** Page 1 of 2
USE The critical design review evaluates the readiness of the project, system, subsystem, or assembly or program to proceed with development, including fabrication, assembly, integration, and test. It assesses the compliance of design with applicable requirements.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RE-001	REFERENCES

The Contractor shall conduct a Critical Design Review with the following objectives:

a. General.
   1. Description of product or process.
   2. Significant results of prior reviews.
   3. Resolution of action items and issues from prior reviews, especially the preliminary design review.
   4. Summary of lower-level critical design reviews and peer reviews, including the status and closure of action items.
   5. Risk assessment.
   6. Open issues requiring resolution.

b. Product design.
   1. Requirements traceability and compliance matrix.
   2. Configuration and design of all hardware, including block diagrams and flow diagrams.
   3. Detail design (electrical, mechanical, structural, thermal).
   4. Function and performance as compared to requirements including cost.
   5. Performance margins relative to required performance (e.g., mass, power).
   6. Differences between the system and subsystem performance and margins relative to the performances estimated at the preliminary design review.
   7. Test results for earlier models or prototypes.
   8. Conformance to environmental design requirements.
   9. Design trade-offs and alternatives considered, decisions made.
   10. Parts, materials, and processes list.
   11. Electronic parts classifications.
   12. Detailed interfaces and cable design.
   13. Safety analysis, including analyses of structural stress, fracture control, and thermal properties.
   14. Reliability analyses (e.g., stress, worst case, error traps).
   15. Radiation susceptibility analysis and design.
   16. Detailed analysis of failures.
   17. P/FR status.

c. Manufacturing readiness.
   1. Manufacturing plans and processes.
   2. Long lead item status.
   3. Documentation, plans, controls, and status.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Critical Design Review (CDR)	**RE 005** Page 2 of 2

d. Test Readiness.
   1. Approach to testing, including test environment.
   2. Test instrumentation requirements.
   3. Calibration plans.
   4. Test flow Plan.
   5. Test Procedure Plan.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Pre Ship Review	**RE 006** Page 1 of 1
USE The Pre-Ship review evaluates the readiness of the product for delivery to JPL or a subcontractor.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP RE 001	REFERENCES

The Contractor shall conduct a Pre-Ship Review with the following objectives:

a. The products and processes to be delivered have been adequately tested to ensure that all requirements have been met.
b. The products and processes, associated documentation and special test equipment are ready for delivery.
c. A plan exists for closing all remaining problems, waivers, or liens.
d. The receiving organization is ready to accept delivery.

The Pre-Ship review shall include, but not be limited to, the following:

a. Status of all drawings, design specifications, and documentation (including engineering change requests).
b. Configuration of hardware being delivered.
c. Compliance with all requirements.
d. Closure status of action items from prior reviews and discussion of all discrepancies (failure or problem reports), waivers, material review boards, and formal inspections.
e. Results of qualification tests and environmental analyses.
f. Comparison of verification test matrix to test plans and procedures.
g. Comparison of requirements to verification test matrix.
h. Results of HVPS, TWT and TWTA functional testing and calibration.
i. Shipping and handling constraints, requirements, and plans.
j. Safety provisions and certification compliance.
k. Documentation and data required for end-item data package.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Safety and Health Plan	**SA 001** Page 1 of 1
USE Required By OSHA.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP Additional General Provision No. 47, Safety and Health; SA-003	REFERENCES OSHA (1970)

PREPARATION INFORMATION

The Occupational Safety and Health Plan required to be submitted by the Contractor pursuant to paragraph (a) of AGP No. 47 shall implement the requirements of AGP No. 47 and shall describe the means to be employed by the Contractor to monitor and enforce safety and health requirements. The plan shall also include the Contractor's standards and criteria for imposing safety and health standards upon its subcontractors for any tier and its plans and procedures for monitoring compliance with such standards. The Contractor's existing plans and procedures shall, to the degree they satisfy the requirements for AGP No. 47 be utilized.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Safety Plan – TWTA	**SA 002** Page 1 of 2
USE The plan will define and describe the plans, techniques, documents, procedures, and special equipment to be employed to protect the flight critical hardware and personnel during all Project phases. The Safety Plan effort need only be commensurate with the hazards associated with the program. A non-hazardous design will require a minimal Safety Plan. More hazardous items will need to be addressed in a more comprehensive effort.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP SA-001	REFERENCES D - 11189

PREPARATION INFORMATION

The proposed Safety Plan will assure maximum practicable safety to personnel and equipment. The safety considerations will include storage, shipping, handling, test, and operations being conducted at the Contractor's facility, as well as those conducted at other establishments. The Contractor shall be responsible for considering all the safety interfaces that his equipment will have with any other system, subsystem, component, or part and for the safety performance of his subcontractors in his regard. The Contractor shall be responsible for:

- Identifying and analyzing all hazards to determine the safety status of equipment or its interfaces with associated personnel and to take reasonable steps to eliminate, control, or accommodate the hazards.

- Reporting in writing at the appropriate time on the safety status and safety controls required for equipment test, checkout, and use. The Hazard Identification, Safety Status and Controls shall be reported on as a part of each review conducted on the system, subsystem, component, or part.

The system, subsystem, equipment or hardware, shall be built, tested, and operated in accordance with local, state, and federal, and country regulations as applicable and shall conform to those safety regulations governing any operation where the equipment is to be used.

All hazards associated with JPL-furnished equipment, designs and procedures for each Contract shall be clearly defined by the cognizant Technical Manager. This "hazard" information shall be transmitted formally to the Contractor in a timely fashion. The Contractor shall acknowledge the existence of these hazards and effect actions which will assure safe operations. The Contract Technical Manager shall be kept informed of this safety action by the Contractor and take necessary action whenever hazardous conditions exist.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Safety Plan – TWTA	**SA 002** Page 2 of 2

PREPARATION INFORMATION (continued)

The Plan shall, as a minimum, describe:

1) Purpose and scope
2) Interpretation of the applicable safety requirements
3) Method of implementation of requirements
4) Safety tasks
5) Organizational elements involved and responsibilities
6) Schedules (start, stop, milestones)
7) Outputs, including deliverable data
8) Safety at subcontractors
9) Safety participation at major reviews
10) Techniques of protecting the flight equipment from unplanned eventualities such as, but not limited to:
(a) Vandalism, (b) Sabotage, (c) Falling objects or dropping,
(d) Sprinkler discharge, (e) Contamination, (f) Transportation damage
11) P/FR evaluation for safety impacts
12) ECR evaluation for safety impacts
13) Environmental overtesting protection
14) Safety Steering Committee activity and implementation
15) Safety Surveys (such as Facility Safety Surveys, Operations Safety Surveys and Transportation Safety Survey and Review)

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Illness, Incident, and Injury Experience Report	**SA 003** Page 1 of 1
USE Required by OSHA. Provides immediate notice concerning any major accident/incident classified as a lost time, or which results in $500 or greater cost.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP Additional General Provision No. 47, Safety and Health; SA-001; SA-002	REFERENCES

PREPARATION INFORMATION

Incident reports shall be generated any time there is an occurrence which has or could have resulted in hardware failure or damage or in personal injury. These reports will be reviewed to insure that a similar instance under slightly different conditions does not cause damage or injury.

The Contractor shall immediately notify and promptly report to JPL any accident or incident or exposure resulting in fatality or disabling occupational injury, or occupational disease to five or more persons, or contamination of property. The Contractor will not be required to include in any report an expression of opinion as to the fault or negligence of any employee. In addition, the Contractor shall comply with any illness, incident and injury experience reporting requirements set forth in the Schedule of this Contract.

The Contractor will investigate all Contract work related incidents or accidents to persons and property occurring on JPL premises to the extent necessary to positively conclude what cause or causes resulted in said accident or incident. The Contractor will furnish a report, in such form as JPL may require, of the investigative findings, together with proposed and/or completed corrective action.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
TWTA (including TWT and HVPS) Test Plan	**TE 001** Page 1 of 1
USE To provide an integrated functional and environmental test plan for testing of hardware and provide a basis for preparing testing procedures and specifications. Defines the acceptance, in-process, qualification, and calibration tests for assemblies and the TWTA EQM, Protoflight TWTAs. Defines the measurement analyses to be completed for functional test.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES JPL D - 10958 (Pt 2&3)

PREPARATION INFORMATION

The Test Plan(s) shall identify all test procedures and shall, in matrix form, list all submodule, module, subassembly, and assembly level tests to be performed on the Engineering Qual Model (EQM), Protoflight Model (PFM), and flight spare modules. As a minimum, the following topics shall be discussed:

1. EQM and PFM hardware and spares and configurations to be tested.
2. Tests to be performed and test flow.
3. Test levels and duration.
4. Verification criteria for pass/fail.
5. Method of testing, facilities/instrumentation and controls to be used.
6. Listing of Test Procedures required.
7. Test data and analysis methodology.
8. Test reporting and documentation methodology.
9. Plans and approach for completing measurement uncertainty analyses for both functional tests and calibration (as applicable).
10. Test Readiness Reviews

The plan will include all functional and environmental tests performed by the contractor and by any and all of its subcontractors and shall reflect the intent of the following:

a) EQM Model TWTA – perform qualification testing
b) Protoflight hardware – perform Protoflight acceptance vibration and thermal testing

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
TWTA (including TWT and HVPS) Test Procedures	**TE 002** Page 1 of 1
USE Provides the detailed step-by-step procedures for testing the TWTA including TWT and HVPS. Allow a determination of the mandatory JPL inspection points. Will result in the verification of all requirements.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES

PREPARATION INFORMATION

(1) The TWTA and major assemblies testing procedures shall identify in step-by-step detail the various activities so that all tests will be conducted in such a way as to protect flight hardware and provide a clear verification of requirements. The Contractor or their subcontractors may use existing in-house test procedures so long as the full intent of the JPL requirements is met.

(2) Preparation information:

a) Prepare one document package for each assembly and TWT, HVPS and TWTA Engineering model or flight test series.
b) Describe and document equipment interfacing with flight hardware.
c) Define the requirements for auxiliary hardware, personnel, and facility safety equipment.
d) Define and document the test configurations including measurements to be made and step-by-step procedures for the conduct of each test.
e) Each procedure document shall include space for recording test results and QA certification within the step-by-step procedure.
f) Each procedure document shall include a summary table for consolidation of test results in a tabular form.

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Test Data and Reports	**TE 003** Page 1 of 2
USE To provide functional, performance, calibration, and environmental test data and reports to JPL as required. To provide visibility and review of environmental test documentation to ensure satisfaction of test specification requirements, test consistency, and traceability.	PROGRAM Ocean Vector Winds Mission Traveling Wave Tube Amplifier
INTERRELATIONSHIP	REFERENCES D - 10960 D - 10958

PREPARATION INFORMATION

Test Data

All test data shall be made available for inspection at the contractor within 2 days of JPL notification of intent to inspect the data.

Test Reports

Prepare one document for each test or test series for each assembly or subsystem level test. The test report shall be delivered to JPL per the CDRL schedule and shall also be included in the EIDP. As a minimum each report shall include the following information:

a) A description of the test configuration and instrumentation.
b) A description of the test sequence.
c) A compilation of the test results. (This compilation may include the summary and test results reported sheets described below).
d) A list and description of specific deviations/changes from the approved test plan or test procedures.
e) Copies of all non-conformance reports (NCR's), P/FR's, MRB action or other documents which define problems/changes/deviations from the approved test plans or test procedures.
f) A Telemetry Calibration Report defining the calibration, for each analog telemetry channel. Each analog telemetry channel shall be calibrated at -20°C, 0°C, +25°C, +55°C and +75°C at the HVPS level. Measured at the HVPS interface.
g) Environmental test reporting documentation shall also be accomplished in accordance with the provisions contained in Seawinds Environmental Program Policy and Requirements, Document 686-039, and Seawinds Environmental Requirements D - 10958.

1. Environmental Analysis Completion Statement (EACS) [JPL Form 2566]: One for each required environmental analysis; all detailed supporting information to be appended to the form.

2. Environmental Test Specification Summary (ETSS) [JPL Form 2014]: Consists of a checklist of environmental tests to be performed on the

DATA REQUIREMENT DESCRIPTION

TITLE	NUMBER
Test Data and Reports	**TE 003** Page 2 of 2

PREPARATION INFORMATION (continued)

specified test article. One form to be completed for each test article, unless re-testing is required (one for each retest).

3. Environmental Test Results Summary form (TRSF) [JPL Form 2816-S]:
Summary of environmental test, duration, test dates, etc., performed on the specified test article. One form to be completed for each test on the specified test article. Preparation instructions are on the back of the form.

4. Environmental Test Reports:
States the results of the test, as well as any anomalies, discrepancies, failure (referencing all P/FRs or contractor equivalent reports prepared as a result of these tests), etc., encountered during the test; shall contain the "as tested" specification and explain any differences between ETSS and "as tested" specifications; shall stated pass/fail status for each phase of the test.